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Abstract

CHEMICAL AND RADIOCHEMICAL ASPECTS OF ITALIAN NUCLEAR POWER PLANTS

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The paper reviews the chemical and radiochemical aspects of the three Italian nuclear power plants.

(a) Garigliano plant (SENN)

The paper discusses particular technical characteristics, such as the use of Monel in the primary circuit (steam generators), which render the data collected on radioactive crud in this plant particularly interesting. Furthermore, the special start-up procedures adopted have allowed the primary circuit crud to be studied, for the first time in a BWR station, under two different operating conditions, to wit,

- without the crud originating in the feedwater heaters;
- with the crud from the feedwater heaters.

Chemical and radiochemical data obtained during start-up and initial operation on core integrity, steam drum decontamination factors, stack release activity, fission products in the primary water and stack release, primary water and feedwater chemistry are also given. These data are supplemented with information on the operation of reactor clean-up, condensate demineralizer, radwaste and defective fuel detection systems.

(b) Latina plant (SIMEA)

Information on the chemical control of CO_2 during start-up and initial operation is provided, with specific reference to carbon oxide concentrations. The concentration of carbon oxide at equilibrium, as an indication of the degree of corrosion and graphite quality, is compared with data relating to similar plants.

A brief mention is made of the analytical methods which were perfected for the determination of impurities in the CO_2, as well as the performance of the CO_2 generating plant installed at the Latina Station. The generating and storage capacities of the latter plant are analysed in respect of the CO_2 requirements experienced during start-up and initial operation.

Finally, problems arising from the use of a special coating compound during erection for the preservation of the primary circuit metal parts are illustrated.

(c) Trino plant (SELNI)

Chemical problems encountered at this plant are considered, as well as their influence on the choice of chemical treatment for the main cooling system. Details are provided on the chemical treatment system of this station, which is planned to operate under chemical shimming.